

REMARKS/ARGUMENTS

Favorable reconsideration of the present application is respectfully requested.

Claims 1 and 6 have been canceled. Claims 2 and 4 have been amended to explicitly recite means for determining a difference between a present torque which the driving power transmission device is transmitting and a target torque which the driving power transmission device is to transmit after the switching of the drive mode. The corresponding structure disclosed in the specification is step 103 in Figure 4 and step 211 in Figure 6.

The rejection of Claim 1 is believed to be moot in light of the cancellation thereof. Claims 2 and 3 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. patent 6,450,921 (Glab et al). However Applicants respectfully submit that Claims 2 and 3 are not anticipated by Glab et al, particularly as now amended.

According to a feature of the invention set forth in Claims 2 and 3, a gradual switching control means gradually decreases the present torque to a target torque to be transmitted after the switching of a drive mode, but only when the difference between the present and target torques is more than a predetermined value at the time of the switching of the drive mode. For example, the predetermined value of the torque difference is 20 Nm or greater in the illustrative embodiments of Figures 4 and 6. In this case, the torque is switched with a delay τ as shown in steps S104 and S212.

Moreover, the gradual switching control means is responsive to a difference determining means for determining a difference between the present torque and the target torque, and gradually decreases the present torque to the target torque only when the torque difference is more than a predetermined value. This has the advantage that the torque is decreased gradually in the case of large torque differences between the present and target torques in order to minimize shocks, but the torque reduction can be applied immediately in the case of small torque differences in order to provide better responsiveness.

Glab et al is directed to a system for controlling a transfer case clutch assembly wherein a torque release strategy incorporates a “start delay” period in which the release torque reference function 122 (Figure 5) decreases gradually so that the actual torque output 124 undergoes a stepped reduction during the start delay. The Office Action did not specifically describe the portion of Glab et al being relied upon to reject Claims 2 and 3, but Applicants presume that the Examiner considers the torque reduction during the start delay period of Figure 5 to comprise the claimed gradual decrease of the present torque to the target torque.

However, there is no teaching in Glab et al that the gradual decrease in torque during the start delay period of Figure 5 should be provided only when the difference between the present and target torques is determined to be more than a predetermined value. For example, according to the operational flow diagram 70 of Figure 3 in Glab et al, the torque release strategy 80 (more particularly 90 in Figure 4) providing the release torque reference curve 122 in Figure 5 is implemented whenever the vehicle speed has exceeded a stored value, the requested clutch duty cycle output exceeds an initial threshold for a predetermined period of time (step 74), and the requested clutch duty cycle output has fallen below a slip torque value (step 78). However, there is no description in Figure 3 that the implementation of the torque release strategy 80 occurs only when a torque difference between the present torque and the target torque is determined to be more than a predetermined value.

Glab et al therefore fails to teach the above feature of amended Claim 2. Instead, Glab et al is concerned with cycling and/or slippage of the clutch as a source of shock (column 1, lines 31-43; column 5, lines 11-15). Cycling or slippage of the clutch is not dependent only on a torque difference in the switching of a drive mode, and so this does not inherently teach the claimed feature of gradually switching the control means responsive to a detected difference between the present and target torque values, only when the difference is

greater than a predetermined value. Glab et al therefore fails to anticipate the subject matter of Claims 2 and 3. Additionally, since Glab et al fails to provide the improved result of reduced shock in the case of switching when the torque difference is large, and enhanced responsiveness in the case of switching when the torque difference is small, Claims 2 and 3 clearly define over this reference.

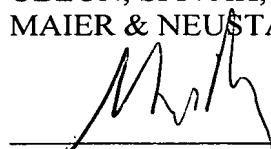
Claim 4 similarly now recites means for determining the difference between the present torque and the driving torque, wherein the gradual switching control means is responsive to the detected difference to gradually decrease the present torque to the target torque only when the difference is more than a predetermined value, and so Claim 4 also defines over this reference. Glab et al is therefore incapable of teaching one skilled in the art to modify Takahashi et al to incorporate such a feature. Claims 4, 5, 7 and 8 therefore define over any combination of the above references.

Claims 2 and 4 have been amended responsive to the claim objection (paragraph 1), which is believed to be moot.

Applicants therefore believe that the present application is in a condition for allowance and respectfully solicit an early Notice of Allowability.

Respectfully submitted,

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